

# JP 8236105

1/9/1

DIALOG(R)File 347:JAPIO

(c) 2003 JPO & JAPIO. All rts. reserv.  
05280605 \*\*Image available\*\*

## MANUFACTURE OF LITHIUM SECONDARY BATTERY POSITIVE ELECTRODE

PUB. NO.: 08-236105 [JP 8236105 A]  
PUBLISHED: September 13, 1996 (19960913)  
INVENTOR(s): KIRIMURA HIROYA  
OGATA KIYOSHI  
EBE AKINORI  
IWAMOTO YASUSHI  
NISHIYAMA SATORU  
APPLICANT(s): NISSIN ELECTRIC CO LTD [000394] (A Japanese Company or Corporation), JP (Japan)  
APPL. NO.: 07-039772 [JP 9539772]  
FILED: February 28, 1995 (19950228)  
INTL CLASS: [6] H01M-004/04; C23C-014/48  
JAPIO CLASS: 42.9 (ELECTRONICS -- Other); 12.6 (METALS -- Surface Treatment)  
JAPIO KEYWORD: R002 (LASERS); R003 (ELECTRON BEAM); R005 (PIEZOELECTRIC FERROELECTRIC SUBSTANCES); R020 (VACUUM TECHNIQUES); R096 (ELECTRONIC MATERIALS -- Glass Conductors)

### ABSTRACT

PURPOSE: To manufacture a lithium secondary battery positive electrode with high film-adhesion property and excellent characteristic of battery by forming a metal oxide film containing lithium on an electrode substrate by jointly using vapor deposition of a lithium containing material and ion beam irradiation.

CONSTITUTION: A lithium-containing material is vaporized from a vaporizing source 3 inside a vacuum chamber 1 having an exhaust device 7, and a vaporized material 3a is vapor-deposited on an electrode substrate S mounted on a base holder 2. At the same time, ion beams are irradiated on the substrate S from an ion source 4. A lithium-containing metal oxide film is formed on the substrate S. As the lithium-containing metal oxide,  $\text{LiMn}_{(2)}\text{O}_{(4)}$ ,  $\text{LiWO}_{(3)}$ ,  $\text{LiCoO}_{(2)}$ ,  $\text{LiNiCoO}$ , and  $\text{LiV}_{(2)}\text{O}_{(5)}$  are used. This ion beam is preferably formed by using an inert gas or an oxygen gas as a raw gas, and an accelerating energy of 100eV-500KeV. By using the lithium-containing metal oxide film as the positive electrode of a lithium secondary battery, the mobility of a lithium ion on the inside hardly drops and desirable battery characteristics is easily obtained.